

Supplementary Table 1: Included studies

Author		JB score & level of evidence	Context	Study type	Setting	Participant Information	N	Tool	General results
Cross Sectional Studies									
DURING OUTBREAKS									
1.	Austria- Corrales (2011)	7 Silver	During H1N1	Cross sectional	Tertiary hospital in Mexico City	Physicians	99	Maslach burnout inventory questionnaire	36.4% of doctors met the criteria for medium to high burnout. Highest rates of burnout in medical residents under 30 years of age, and those in their second year of specialization in the area of pneumology.
2.	Bai (2004)	8 Silver	During SARS	Cross sectional	1 hospital, East Taiwan	Medical, nursing, physician associates with direct contact (64.5%); Administrative staff with indirect contact (35.5%)	338	Questionnaire based on DSM 4 - acute stress disorder	5% participants reported acute stress disorder. Those with direct contact reported significantly more insomnia, exhaustion, and uncertainty about infection control procedures. 20% felt stigmatised and 15% had a fear of infecting family.
3.	Bukhari (2016)	7 Silver	During MERS	Cross sectional	Saudi Arabia	Nurses (75.9%), doctors, allied health, medical interns, radiographers etc.	386	IES, questionnaire on SARS exposure, perceived risk of infection, and impact of the outbreak on personal and work life	33.2% of respondents were 'extremely' or 'very' worried. Greater stress in nurses working in isolation, ICU or emergency settings in the hospital.
4.	Chan (2004)	8 Silver	During SARS	Cross sectional	1 hospital, Singapore	Medical, nursing staff (17% direct contact)	661	GHQ and IES	27% participants had mental health symptoms and 20% scored within the PTSD range. There was no difference between those with direct or indirect contact with SARS patients.

5.	Chan (2005)	7 Silver	During SARS	Cross sectional	8 public hospitals, Hong Kong	Nursing staff (13.4% direct contact)	1470	SARS Nurses' Survey Questionnaire (SARS NSQ)	Most nurses (68.3–80.1%) perceived stress from the SARS epidemic especially those at higher risk of SARS exposure
6.	Cheng-Sheng Chen (2005)	6 Silver	During SARS	Cross sectional	Kaohsiung Municipal Hsiao-Kang hospital, Southern Taiwan	Nursing staff (65.6% direct contact)	131	IES-R	11% of participants experienced psychological stress within the PTSD range
7.	Chua (2004)	7 Silver	During SARS	Cross sectional	Hong Kong	Medical, nursing, ward assistants with direct contact (44.2%); Healthy community subjects with indirect contact (55.8%)	613	PSS-10	Stress levels were significantly elevated during the outbreak in participants and community control subjects, above expected norms.
8.	Fiksenbaum (2006)	6 Silver	During SARS	Cross sectional	Tertiary hospital, Ontario, Canada	Nursing staff (23.4% direct contact)	333	Questionnaire, Survey of Perceived Organizational Support, Maslach Burnout Inventory—General Survey, State-Trait Anger Expression Inventory	Psychological stress led to higher emotional exhaustion and state anger. Good organisational support was associated with lower threat, emotional exhaustion and state anger.
9.	Goulia (2010)	6 Bronze	During H1N1	Cross sectional	University General Hospital, Ioannina, Greece	Medical, nursing, allied health, auxiliary staff	469	Cassileth's Information Styles Questionnaire (part-I) and the GHQ-28.	20.7% participants experienced psychological distress, with nurses being more worried than medical staff.
10.	Grace (2005)	5 Silver	During SARS	Cross sectional	Canada	Medical staff (23% direct contact)	193	Specifically designed scale	Significantly higher rate of psychological distress in those providing direct care to SARS patients (45.7%) compared to indirect care (17.7%).
11.	Hawryluck (2004)	8 Bronze	During SARS	Cross sectional	Canada	Quarantined health care workers	86	IES- R and CES-D	28.9% participants experienced psychological stress within PTSD range. Additionally, 31.2% had symptoms consistent with depression.

12. Ho (2005)	6 Bronze	During SARS	Cross sectional	Public hospitals, Hong Kong	Medical, nursing, auxiliary staff (54.2% with SARS infection)	179	SARS Fear Scale and SARS self-efficacy scale (created). Chinese Self-Efficacy Scale, IES-R - for those with direct contact.	Both those infected and not had equal concern of self-infection and infecting others. Those infected had a stronger fear of infection than those not, who were more concerned about other health problems and discrimination.
13. Huang (2020)	6 Bronze	During COVID-19	Cross sectional	Fuyang, China	70 doctors 160 nurses	230	SAS, Post-Traumatic Stress Disorder Self-rating Scale	Higher levels of anxiety in females and in nurses. Stress scores were also higher in females compared to males.
14. Khalid (2016)	4 Bronze	During MERS	Cross sectional	Tertiary care hospital, Jeddah, Saudi Arabia	Medical, nursing, respiratory therapists (100% direct contact)	117	Questionnaire - derived from Lee et al.	Majority (96%) participants felt nervous and scared during the outbreak
15. Kim (2016)	8 Silver	During MERS	Cross sectional	15 MERS hospitals in Korea	Emergency department nurses	215	Oldenburg Burnout Inventory (OLBI), fear scale, anxiety scale, family/friend support scale, hospital resource scale,	MERS related job stress, availability of hospital resources and support from family and friends explained 47.3% of the variance in MERS-related burnout
16. Koh (2005)	7 Silver	During SARS	Cross sectional	9 hospitals, Singapore	All hospital employees	10511	Impact of SARS questionnaire, IES	Approximately two-thirds participants reported feeling at great risk of exposure (higher IES scores) 76% reported fears of infection, though 69.5% accepted this risk as part of occupation.
17. Lai (2020)	8 Silver	During COVID-19	Cross sectional	China	Physicians and nurses	1257	Generalized Anxiety Disorder scale (GAD-7), Insomnia Severity Index (ISI), Patient Health Questionnaire (PHQ-9), IES-R	Overall, 50.4%, 44.6%, 34.0%, and 71.5% of participants reported symptoms of depression, anxiety, insomnia, and distress, respectively Nurses, women, frontline workers, and those in Wuhan reported more severe mental health symptom levels. Participants working in secondary

								hospitals were more likely to report severe depression and anxiety, than those in tertiary hospitals
18. Lee (2005)	4 Bronze	During SARS	Cross sectional	Emergency Department, Northern Taiwan	Nursing staff (100% direct contact)	26	Semi structured interview - designed SARS Team Questionnaire (72 items)	Major stressors included worry about colleagues, patients and family, as well as concern about the lack of knowledge of the virus and changing infection control measures.
19. Lehmann (2016)	8 Silver	During Ebola	Cross sectional	2 University hospitals in Germany	Internal medicine nursing and medical staff; Ebola treatment nursing and medical staff; laboratory staff	86	12-item Short Form Health Survey, questionnaire with a 4-point scale to assess subjective experiences: perceived risk, social isolation, FACIT, PHQ-9, GAD-7, SSS-8.	Direct patient contact and contact with the Ebola pathogen had no significant impact on the physical and mental components of health-related quality of life. Social isolation however was very common amongst staff caring for Ebola infected patients. Self-rated knowledge was lower in the groups who were not caring for Ebola patients.
20. Li (2015)	8 Bronze	During Ebola	Cross sectional	China Ebola Treatment Unit, Liberia	Nursing, hygienist staff	52	SCL-90-R questionnaire; Global Severity Index (GSI) for overall psychological health; PST and PSDI used to assess mean distress level	Mental distress was not as serious as expected amongst participants. This may have been a result of early psychosocial support and close cooperation from the organisation.
21. Lu (2006)	6 Bronze	During SARS	Cross sectional	Teaching hospital, Taiwan	Medical, nursing, allied health, auxiliary staff (100% direct contact)	127	Chinese Health Questionnaire, EPQ, PBI	17.3% of participants had mental health symptoms, with no difference in age, occupation, gender or marital status in adjusted analyses.

22. Maunder (2004)	8 Silver	During SARS	Cross sectional	3 hospitals, Toronto, Canada	Medical, nursing, other health care workers	1557	Questionnaire, IES and Study of Healthcare Workers' Perception of Risk and Preventive Measures for SARS Questionnaire	36% of participants experienced psychological stress within the PTSD range.
23. Nickell (2004)	6 Bronze	During SARS	Cross sectional	Sunnybrook and Women's College Health Sciences Centre (3 hospital sites), Toronto, Canada	All hospital employees	Part A: 2001, Part B: 510	Part A: Questionnaire about SARS, precautionary measures, personal well-being. Part B: GHQ	29% of participants had mental health symptoms, affected by occupation and risk perception.
24. Park (2018)	8 Bronze	During MERS	Cross sectional	Government hospital, Gyeonggi-do, South Korea	Nursing staff (100% direct contact)	187	MOS- SF 36, PSS-10, DRS-15 Stigma scale	Stigma directly related to mental health but also indirectly through stress
25. Poon (2005)	7 Silver	During SARS	Cross-sectional	Pamela Youde Nethersole Eastern Hospital, Hong Kong	Nursing, allied health, support staff (27.7% direct contact)	1926	State-Trait Anxiety Inventory	Participants with direct contact with SARS patients had higher anxiety levels and this correlated with higher burnout scores.
26. Sim (2004)	8 Silver	During SARS	Cross-sectional	Public primary health care, Hong Kong	Medical, nursing staff	277	GHQ-28; IES-R; Brief COPE	20.6% of participants had mental health symptoms and 9.4% experienced psychological stress within the PTSD range. Psychiatric morbidity was associated with PTSD and denial. No significant difference fever clinic vs other areas
27. Sin (2004)	6 Bronze	During SARS	Cross-sectional	Singapore	Rehabilitation staff (physiotherapists, occupational therapists, speech pathologists, support staff)	55	GHQ and IES	23.4% of participants had mental health symptoms and 12.8% experienced psychological stress within the PTSD range

28. Tam (2004)	8 Silver	During SARS	Cross sectional	Prince of Wales Hospital, Alice Ho Miu Ling Nethersole Hospital and Tai Po Hospital, Hong Kong	Medical, nursing, allied health staff	652	GHQ + questionnaire	68% participants reported significant or severe job stress and 57% had mental health symptoms. Staff's perception of risk, rather than direct exposure to SARS patients, contributed to psychological morbidity
29. Tang (2017)	8 Silver	During H7N9	Cross sectional	1 hospital, Anhui Province, China	Medical, nursing staff (100% direct contact)	102	PCL-C	PTSD was seen in 21% of participants with mean PCL-C score of 30.00. Worse in high contact staff
30. Yu (2003)	8 Silver	During SARS	Cross sectional with controls	Beijing Ditan Hospital (SARS designated hospital) China	143 medical staff 53 citizen controls	196	Self-designed SARS questionnaire, SCL-90	Medical staff had higher positive symptom distress levels than the general population. Obsessive-compulsive symptoms (e.g. excessive cleaning) was increased in frontline workers.
31. Xuehua (2003)	7 Silver	During SARS	Cross sectional with controls	SARS hospitals China	101 nurses 50 controls	151	Beck depression scale (BDS), state and trait anxiety inventory (STAI) and SCL- 90	52% of nurses had depressive symptoms, with 30% of these have moderate or severe depression. No controls had depressive symptoms. Nurses also had higher SCL-90 scores
32. Dai (2020) – pre-print	7 Silver	During COVID-19	Cross sectional study	China	2343 nurses 1419 doctors 437 technicians 158 support staff	4357	Questionnaire with 6 questions on 5-point scale on perceptions of risk of COVID-19, GHQ-12	The greatest concerns were around infection of colleagues and infection of family members. Nurses were more worried about self-infection at work than doctors, technicians and support staff. 39.1% of participants had psychological distress.

33. Liu (2020) – pre-print	7 Silver	During COVID-19	Cross sectional study	China	Doctors, nurses and administrative workers from Chinese hospitals	512	SAS, questionnaire about demographics, exposure and recent behaviours	Working in COVID-19 patient care, suspect cases and being from Hubei province were all risk factors for increased anxiety scores,
34. Huang (2020) – pre-print	7 Silver	During COVID-19	Cross-sectional study	Anhui province, China	Nurses and nursing college students	804	Questionnaire with 5-point rating scale for experiences of anxiety, fear, sadness and anger in response to COVID-19 outbreak, questionnaire based on Brief COPE tool looking at coping strategies	Nursing college students experience far less psychological stress than nurses. Nurses however used significantly more problem-focused coping methods. This study also found that participants from urban showed more anxiety and fear than participants from rural, but rural participants showed more sadness than urban participants
35. Xing (2020) – pre-print	8 Silver	During COVID-19	Cross sectional study	China	Medical personnel 25% doctors 75% nurses	548	SCL-90	Symptoms of somatization, obsessive-compulsive, anxiety, phobic anxiety, and psychoticism were significantly higher in medical personnel. Older medical personnel had more psychological stress when dealing with COVID-19 patients due to their increased vulnerability to the virus. The average interpersonal sensitivity factor scores were lower in medical personnel, showing most medical personnel were united and had good professional strengths and qualities for self-regulation and self-protection
36. Zhou (2020) – pre-print	7 Bronze	During COVID-19	Cross sectional study	Tongji Hospital China	Doctors, nurses, clinical technicians	5062	Questionnaire on perceptions of threat of COVID-19 and psychological protective measures, IES-R, PHQ-9, Generalised Anxiety Disorder 7-item rating scale	29.8%, 13.5% and 24.1% HCW reported stress, depression, and anxiety symptoms respectively. Full coverage with protective measures, care provided by hospital departments, and reasonable shift arrangement were identified as protective factors.

AFTER OUTBREAKS

37. Lin (2007)	8	Immediately after SARS	Cross sectional	Taiwan	Emergency department medical, nursing staff with direct contact (72%); Psychiatry staff with indirect contact (28%)	92	Davidson Trauma Scale-Chinese version (DTS-C) and GHQ	93.5% of participants considered the SARS pandemic traumatic.
	Silver							
38. Marjanovic (2007)	6	1 year post SARS	Cross-sectional	Ontario, Canada	Nursing staff	333	Maslach Burnout Inventory-General Survey, State-Trait Anger Expression Inventory, Six-item Vigour Scale and the Survey of Perceived Organizational Support	Lower levels of avoidance behaviour, emotional exhaustion, and state anger were seen in participants with increased resilience, organizational support, and trust in procedures, equipment/infection control. Lower levels of contact with SARS patients and time spent in quarantine predicted lower mental health symptoms.
	Bronze							
39. Matsuishi (2012)	8	1 month post H1N1	Cross-sectional	Tertiary teaching hospitals, Kobe City, Japan	Medical, nursing, other staff	1625	IES	high-risk environments led to participants having higher IES scores
	Silver							
40. Maunder (2006)	7	13-26 months post SARS	Cross sectional	9 hospitals, Toronto and 4 hospitals, Hamilton, Canada	Medical, nursing, respiratory therapists, clerical staff (24.3% direct contact)	769	Part A (all): IES, Kessler psychological distress scale, emotional exhaustion scale of the Maslach Burnout Inventory, questionnaire; Part B (direct contact): Study of Healthcare Workers' Perception of Risk and Preventive Measures for SARS Questionnaire, Ways of Coping Questionnaire, Experiences in Close Relationships-Revised Questionnaire	Participants with direct contact with SARS patients had higher levels of burnout and PTSD. Since SARS, the staff had decreased their work hours and patient contact time, as well as increased maladaptive behaviour and absenteeism.
	Silver							

41. Phua (2005)	8 Bronze	6 months post SARS	Cross sectional	1 hospital Emergency Department, Singapore	Medical, nursing staff (100% direct contact)	96	GHQ, IES, COPE	18.8% of participants had mental health symptoms and 17.7% experienced psychological stress within the PTSD range. Humour and planning as a coping strategy were more common in medical staff, while emotion-focused coping and religion more important for nursing staff.
42. Styra (2008)	8 Silver	Just after SARS	Cross-sectional	Toronto, Canada	Health care workers (64.5% direct contact)	248	Study-specific survey; IES-R	Greater distress was seen in participants with higher risk of exposure to patients with SARS.
43. Verma (2004)	7 Silver	2 months post SARS	Cross sectional	Singapore	General practitioners (68.7%), Traditional Chinese Medicine practitioners (31.3%)	1050	GHQ, IES -R, Questionnaire on stigma (adopted from HIV stigma scale)	14.1% participants had mental health symptoms. This was affected by fear of infecting self and others, uncontrolled spread of infection in the community and financial problems due reduced patient attendance.
44. Wong (2005)	6 Bronze	Just after SARS	Cross-sectional	14 hospital Emergency Departments, Hong Kong	Medical, nursing, health care assistants	466	Distress questionnaire; Chinese version Brief COPE questionnaire	The mean overall level of distress in workers was 6.19 (scale 0-10). This was affected by loss of control/vulnerability, fear for self-health and fear of infection spread.
45. Wong (2004)	7 Silver	During SARS	Cross sectional	Hong Kong	General practitioners	137	Questionnaire developed on: demographic data, training for SARS, anxiety scale, clinical practices, and use of screening tools	Females were more concerned about infecting their families. Younger participants felt SARS had a greater impact on their quality of life. Doctors spent less time with patients or avoided physical examinations due to worry about infection. However, anxiety scores on all parameters were less than 5 on a 10-point scale.
46. Wu (2009)	8 Silver	3 years post SARS	Cross sectional	Hospital, Beijing, China	SARS unit staff	549	IES-R, SARS questionnaire, Exposure to other traumatic events questionnaire, Perception of SARS related risks Questionnaire, current fear of SARS. CES-D,	10% participants experienced psychological stress within the PTSD range. Many (40%) of those with initial PTSD continued to have a high level of symptoms 3 years later, which was associated with being single and lower. Experience of high levels of PTS symptoms during and after SARS outbreak, was strongly associated with current depressive symptom levels 3

								years later. Household income and not level of exposure was the greatest risk factor for these workers.
47. Oh (2017)	8 Silver	1 year after MERS	Cross sectional study	South Korea	Nursing staff 141 had 'first hand' contact with MERS patients 172 worked in other areas of the hospital	313	60-question questionnaire developed based on several previous tools, to assess: level of stress during MERS, professionalism, intention to provide care for patients during the outbreak.	Nursing intention was significantly higher among the nurses with 'first-hand' experience, than nurses in other hospital areas. Nursing experience in previous outbreaks was significantly associated with nursing intention in this study.
Qualitative/ Narrative Studies								
DURING OUTBREAKS								
48. Chen (2020)	N/A N/A	During SARS-CoV-19	Qualitative/ narrative	The Second Xiangya Hospital, Changsha, China	Medical staff (100% direct contact)	13	Semi-structured interviews	Participants reported high levels of psychological distress. Distress was increased when patients who were infected, refused to cooperate with staff plans.
49. Kang (2018)	8 N/A	During MERS	Qualitative	South Korea	Nursing staff (100% direct contact)	27	7 focus groups and 3 individual in-depth interviews	There were high levels of burnout reported by participants due to increased workload, ongoing fear of infection and frequently changing hospital guidelines.
50. Robertson (2004)	8 N/A	During SARS	Qualitative	Toronto, Canada	Quarantined health care workers	10	Semi-structured interviews	Participants reported stigma, fear and frustration, in line with a sense of duty to continue work and care for family.

AFTER OUTBREAKS

51. Belfroid (2018)	7 N/A	1-2 years post Ebola	Qualitative	University hospitals, Netherlands	Medical, nursing, administrative staff	26	Focus groups and 23 in-depth interviews	Most staff felt positive about the experience of caring for those infected. Distress was associated with the novelty of the threat, risk of infection, fear of transmission and excessive attention.
---------------------	----------	----------------------	-------------	-----------------------------------	--	----	---	--

Longitudinal Studies

DURING OUTBREAKS

52. Chen (2006)	8 Bronze	During SARS	Longitudinal	SARS designated treatment hospital, Taiwan	Nursing staff	116	Xung's Self-Rating Anxiety Scale and Depression Scale; Pittsburgh Sleep Quality Index	On average, moderate levels of depression & anxiety resolved following implementation of the SARS prevention programme
53. Chen (2007)	7 Silver	During SARS related shifts and 4 weeks later	Longitudinal	Chang Gung Memorial Hospital, Taipei, Taiwan	Medical, nursing, respiratory care specialists, technicians, ancillary support workers with direct contact (52.3%); Administrators, volunteers, assistants, part time workers with indirect contact (47.7%).	172	MOS SF-36	The length of contact predicted emotional, physical and mental health outcomes. Those with direct contact had worse quality of life scores after their shifts, although this improved following self-quarantine and off duty shifts.
54. Chong (2004)	9 Silver	During SARS and 1 month post	Longitudinal	The Chang Gung Memorial Hospital, Southern Taiwan	Medical, nursing and administrative staff	1257	GHQ	75% of participants had mental health symptoms during SARS and this increased to 81% one month later.
55. Lee (2018)	7 Silver	During and 1 month post MERS	Longitudinal	Kyung Hee University Hospital, Gangdong, South Korea	Medical, nursing, pharmacy, administration (21.4% direct contact)	359	Part A (all): IES-R; Part B (direct contact 1 month post): questionnaire	Participants with direct contact with MERS affected patients had higher mean psychological stress score than those without contact. 64.1% of participants experienced psychological stress within PTSD range
56. McAlonan (2007)	9 Silver	During SARS and 1 year post SARS	Longitudinal	2 hospitals, Hong Kong	Medical, nursing, other staff (60.2% direct contact)	176	Baseline: PSS-10 1-year post: , PSS-10, DASS-21, IES-R	At baseline, both those with direct and indirect contact had equally high perceived stress levels. At follow up 1 year later, stress levels were greater in

								those who had direct contact with SARS patients during the outbreak.
57. Su (2007)	9	During SARS	Longitudinal	SARS units, Taipei, Taiwan	Nursing staff (69.4% direct contact)	108	Beck Depression Inventory; Spielberger Trait Anxiety Inventory; Chinese version of the Davidson Trauma Scale; Sheehan Disability Scale	Depression was greater in participants with direct contact with SARS patients (38.5% vs. 3.1%) but there was no significant difference in post-traumatic stress symptoms (33% vs. 18.7%).
	Silver							

AFTER OUTBREAKS

58. Lancee (2008)	7	2 years post SARS	Longitudinal **Linked to Maunders (2004)	ICU/ED/SARS units in Academic and community hospitals, Toronto, Canada	Medical, nursing staff (76% had direct contact)	Part A: 139, Part B: 133	Clinician-Administered PTSD Scale, Structured Clinical Interview for DSM-IV	Major depression and new onset of any psychiatric disorder were more common among health care workers with a history of psychiatric illness, with new episodes of psychiatric disorders occurring in 5% of participants 1-2 years after the outbreak.
	Silver							
59. Lung (2009)	8	1 year post SARS	Longitudinal	Teaching hospital, Taiwan	Medical, nursing, other health care workers	123	GHQ, EPQ, PBI	15.4% participants had mental health symptoms, which was lower than in the general population. However, the level of somatic symptoms was higher, especially in medical staff.
	Bronze							

CES-D	The Centre for Epidemiologic Studies Depression Scale
COPE	Coping orientation to problems experienced questionnaire
DASS-21	Depression and Anxiety Scale
DRS-15	Dispositional Resilience Scale-15
EPQ	Eysenck Personality Questionnaire
FACIT	Functional Assessment of Chronic Illness Therapy
GAD 7	Generalized Anxiety Disorder scale
GHQ	General Health Questionnaire
IES	Impact of Event Scale
IES-R	Impact of Event Scale – Revised
MOS- SF 36	The Short Form-36 to measure the overall health status of general populations

PBI	Parental Bonding Instrument
PCL-C	PTSD Checklist-Civilian Version
PHQ-9	Patient Health Questionnaire
PSS-10	Perceived Stress Scale-10
PST	Positive Symptom Total
PSDI	Positive Symptom Distress Index
SAS	Self-rating Anxiety Scale
SCL-90	Symptom Checklist -90
SSS-8	